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ABSTRACT

Previous research has demonstrated a relationship between questions asked by teachers and corresponding levels of student achievement. The present study was designed to measure the effect of a unit in which fifth-grade students were taught a system of question classification. The results as measured by the criterion instrument Question Classification Inventory indicated that significant differences in achievement occurred in favor of the group which was taught a question classification scheme over two other groups. (Appropriate tables are included in the text.) (Author)

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## Abstract

Previous research has demonstrated a relationship between questions asked by teachers and corresponding levels of student achievement. The present study was designed to measure the effect of a unit in which fifth grade students were taught a system of question classification. The results as measured by a criterion instrument titled a Question Classification Inventory indicated that significant differences in achievement occurred in favor of the group which was taught a question classification scheme over two other groups.

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# Question Classification Instruction in a Human Behavior Unit

by

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A topic given considerable attention in recent literature is that of the use of questions in instructional situations. Based in most instances upon Bloom's model (1), a host of question-classification systems have lately sprung forth (2, 4, 10). In a number of instances, these classifying systems have been used to mark the types of questions which teachers ask students in instructional situations (5, 8). It has been noted that a relationship exists between the types of questions teachers ask and the corresponding level of achievement attained by their students (8). Another idea which might be considered is one related to the student's independent ability to recognize and classify different types of questions. The ability to make discriminations among levels of questions is a potentially powerful tool for a learner to have at his disposal. The concept of the student as an independent inquirer, whether it be in the context of establishing a problem for an investigative activity, questioning sources of information, or "answering questions" in oral or written form, is predicated in part upon his ability to make effective use of a variety of types of questions. While the fact that a student is capable of recognizing different types of questions does not ensure that he will make effective use of them, it does follow that the lack of such a capability

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places severe restrictions upon an inquirer. Therefore, one might well pose the problem of whether students are capable of learning a taxonomy of question types. The present investigation represents inquiry into the outcome of an instructional sequence designed to teach students to recognize and classify types of questions.

The purpose of the present investigation was to determine the effects in student achievement among three groups: (a) question-classification instruction, (b) question-related instruction without classification, and (c) unrelated instruction (control).

## DESCRIPTION AND PROCEDURES

The students and teachers were assigned by simple random selection to each of the study's three groups. Following is a description of each group.

### Question-Classification Instruction (QCI)

The students were given instruction and practice in a system of question classification during their study of a social studies unit on human behavior.

### Question-Related Instruction without Classification (QRI)

The students were given instruction identical to that of the first group except that they did not classify the questions in the unit.

### Control

The students were given instruction in a "typical" social studies unit on the Westward Movement.

Student Population

The study's final N was comprised of 63 fifth grade students from three classrooms. The school is located in an area described as "lower middle class". The mean Intelligence Quotient as measured by the Lorge-Thorndike Intelligence Test, Intermediate Verbal Battery, was 103.88. Because a total of six subjects were either (1) absent for an extended period during the instructional time, (2) absent on the day the post-test was administered, or (3) absent on the day the retention test was administered, they were dropped from the study. This loss of six subjects is recognized as a possible limiting factor in the study's results in that differential treatment mortality can pose a threat to an experiment's internal validity (3).

THE INSTRUCTIONAL SEQUENCE

Students in the question classification instruction group (QCI) and students in the question related instruction group (QRI) studied a social studies unit on Human Behavior. Comprised of case studies and behavior specimens, the unit was developed by the author as one which had potential for a variety of levels of questions. Each day the teacher in each of the two groups would read aloud one or more case studies or behavior specimens after which he would seek answers to the questions prepared for the particular problem. Utilizing three classes of questions, (1) memory, (2) explanation, and (3) higher level, the students were involved successively with one type per day for the first three days. The succeeding three days of the six day unit were devoted to the use of all three question types on each day.

The crucial difference, then, between the two groups was that the QCI group were introduced to the classification scheme and were asked to classify the questions which they were answering, while the QRI group merely answered the questions. Because the QCI group spent time classifying questions, the instructional time involved an additional ten minutes per day so that instructional time was 45 minutes per day for QCI and 35 minutes per day for QRI. In order to minimize any possible problems arising from reading difficulties, all instruction was done orally.

Following are descriptions of the three question classification types used in the study.

Memory. Questions which seek the recall of specific items of information. For example, "What was the name of the girl who took the bracelet from the store?"

Explanation. (1) Questions which seek a reason or reasons for the occurrence of an event or phenomenon from a descriptive standpoint. For example, "Why do some people become frightened when they are asked to speak in front of a group?" or (2) Questions which seek an interpretation of an event or phenomenon. For example, "What are some differences between a structured group and an unstructured group?"

Higher Level. Questions which seek answers which may not be retrieved by referring simply to information stated explicitly and which tend to invite divergence of response. In this regard, this category serves as an umbrella for such commonly used question labels as "probing," "divergence," "expansion," and "creative."

For example, "Should the students who voted 'no' have to accept the new rule?"

The design used was a post-test only control group design (3). The study met the assumption of random assignment of individual subjects to treatment groups.

On the seventh day the criterion instrument (Question Classification Inventory, developed by the author) was read aloud to all the subjects as a post-test. The test was again administered orally as a retention test on the twenty-first day. No instruction related to the study was given in the interim.

The criterion instrument was a 48 item multiple choice test with a reliability of .87 (Kuder, Richardson Formula 20). The items used were selected from a larger pool of items by means of item-analysis indices of discrimination and difficulty.

## RESULTS AND DISCUSSION

Tables 1 and 2 summarize the post-test findings. A significant difference between the QCI group and the other two groups was found at the .01 level. Results of the retention test are summarized in Tables 3 and 4. A significant difference (.01 level of significance) was again found between the QCI group and the other two groups.

The results indicate that indeed the fifth grade students in the question classification instruction group were able to learn and apply a classification system for question types. The significant difference found between groups one (QCI) and two (QRI) indicates that the mere use of various types of questions in this instruction

Table 1

Post Test Means and Standard Deviations for Each Group

| Group | | Mean | S.D. |
|---|---|---|---|
| QCI | (Question Classification Instruction) | 36.57 | 10.59 |
| QRI | (Question Related Instruction) | 27.32 | 9.38 |
| C | (Control) | 23.83 | 10.09 |

Table 2

One Way Analysis of Variance for Post Test Results

| Source | df | SS | MS | F |
|---|---|---|---|---|
| Between Groups | 2 | 1872.43 | 936.22 | 9.26* |
| Error (Within Groups) | 60 | 6064.55 | 101.08 | |
| Total | 62 | 7936.98 | | |

*$p < .01$

Table 3

Retention Rest Means and Standard Deviations for Each Group

| Group | | Mean | S.D. |
|---|---|---|---|
| QCI | (Question Classification Instruction) | 38.05 | 10.19 |
| QRI | (Question Related Instruction) | 26.11 | 11.35 |
| C | (Control) | 23.04 | 9.98 |

Table 4

One Way Analysis of Variance for Retention Test Results

| Source | df | SS | MS | F |
|---|---|---|---|---|
| Between Groups | 2 | 2694.24 | 1347.12 | 12.27* |
| Error (Within Groups) | 60 | 6587.70 | 109.79 | |
| Total | 62 | 9281.94 | | |

*$p < .01$

was not effective in promoting the independent capability on the part of the students to differentiate among question types. Certainly, the ability to do so is a potentially powerful tool for a student to have in his repertoire. The results obtained would further indicate that perhaps more sophisticated classification schemes ought to be tried with students. Such a system could involve distinctions between types of higher level questions.

The correlations achieved between students' scores on the Lorge-Thorndike Intelligence Test and the criterion instrument suggest that the method used to teach (for each group and for post-test and retention test respectively: QCI .76, .89; QRI .63, .69; Control .33, .37) the students a system of question classification was rather successful in the instance of higher IQ students but somewhat less so in the instance of lower IQ students. While this is perhaps to be expected, it could be hypothesized that alternative means of instruction might produce more successful results with lower IQ students.

Table 5

IQ Means and Standard Deviations for High and Low Achievers on the Lorge-Thorndike Intelligence Test

| | Mean | S.D. |
|---|---|---|
| High Achievers | 119.06 | 6.89 |
| Low Achievers | 89.65 | 4.50 |

Table 6

Post-Test Means and Standard Deviations for High and Low IQ Test Achievers and for Each Group

| Group | Post -Test Mean | Post -Test S.D. | Retention Test Mean | Retention Test S.D. |
|---|---|---|---|---|
| High Achievers | 33.82 | 10.09 | 34.18 | 11.35 |
| Low Achievers | 2194 | 11.21 | 21.59 | 11.49 |

## Conclusions

The purpose of the study was to determine whether a group of fith-grade students could learn a system of question types. The results obtained indicated a significant difference in achievement as measured by a criterion instrument in favor of the group which was taught such a classification system over a group which used the same questions but did not learn to classify them, and a group which dealt with social studies in a "typical" fashion. These results appear to warrant the following conclusions:

1. The students in the QCI group were able to learn a useful system for classifying questions in a relatively short period of time.
2. The students in the QCI group retained knowledge of the classification system over an extended period of time.
3. The mere use of higher level questions did not help the students in the QRI group to learn to discriminate among types of questions.
4. The Question Classification Inventory is a useful tool for determining whether students are capable of discriminating types of questions.

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